-continued

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What is claimed is:

1. An antibody or an antigen-binding fragment thereof that binds to Ep-CAM, wherein the heavy chain variable CDR3 region has the amino acid sequence SEQ ID NO: 6, 7, 8, 3, 5, or 9.

2. The antibody or the antigen-binding fragment thereof of claim **1**, wherein the heavy chain variable CDR1 has the amino acid sequence of SEQ ID NO: 10, and the heavy chain variable CDR2 has the amino acid sequence of SEQ ID NO: 11.

3. The antibody or the antigen-binding fragment thereof of claim **1**, wherein the light chain variable CDR1 has the amino acid sequence of SEQ ID NO: 12, the light chain variable CDR2 has the amino acid sequence of SEQ ID NO: 13, and the light chain variable CDR3 has the amino acid sequence of SEQ ID NO: 14.

4. The antibody or the antigen-binding fragment thereof of claim **1**, wherein V_L comprises the amino acid sequence of SEQ ID NO: 15 or 16, and V_H comprises the amino acid sequence of SEQ ID NO: 17, 18, 19, 20, 21, or 22.

5. The antigen-binding fragment of claim **1**, which is single chain variable fragment (scFv).

6. The scFv of claim **5**, wherein the heavy chain variable CDR3 region has the amino acid sequence SEQ ID NO: 6, 7, or 8.

7. A chimeric antigen receptor fusion protein (CAR) comprising from N-terminus to C-terminus:

(i) the scFv of claim **6**,

(ii) a hinge domain

(iii) a transmembrane domain,

(iv) at least one co-stimulatory domains, and

(v) an activating domain.

8. The CAR according to claim **7**, wherein the co-stimulatory domain is selected from the group consisting of CD28, 4-1BB, ICOS-1, CD27, OX-40, GITR, and DAP10.

9. The CAR according to claim **7**, wherein the activating domain is CD3 zeta.

10. An isolated nucleic acid sequence encoding the CAR of claim **7**.

11. T cells or natural killer cells modified to express the CAR of claim **7**.

12. An adoptive cell therapy method for treating cancer, comprising the steps of:

administering the CAR-T cells of claim **11** to a subject suffering from cancer, wherein the cancer cells of the subject overexpress EpCAM, and the CAR T cells bind to the cancer cells to kill the cancer cells.

13. The method according to claim **12**, wherein the cancer is colon, intestine, breast, lung, prostate, gastric, pancreas, bladder, gall bladder, nasopharyngeal, colorectal, ovarian, or lung cancer.

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